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The Hazwaste Response • Computers in Public Works

A Publication of Communication Channels, Inc.

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AMERICAN CITY & COUNTY®

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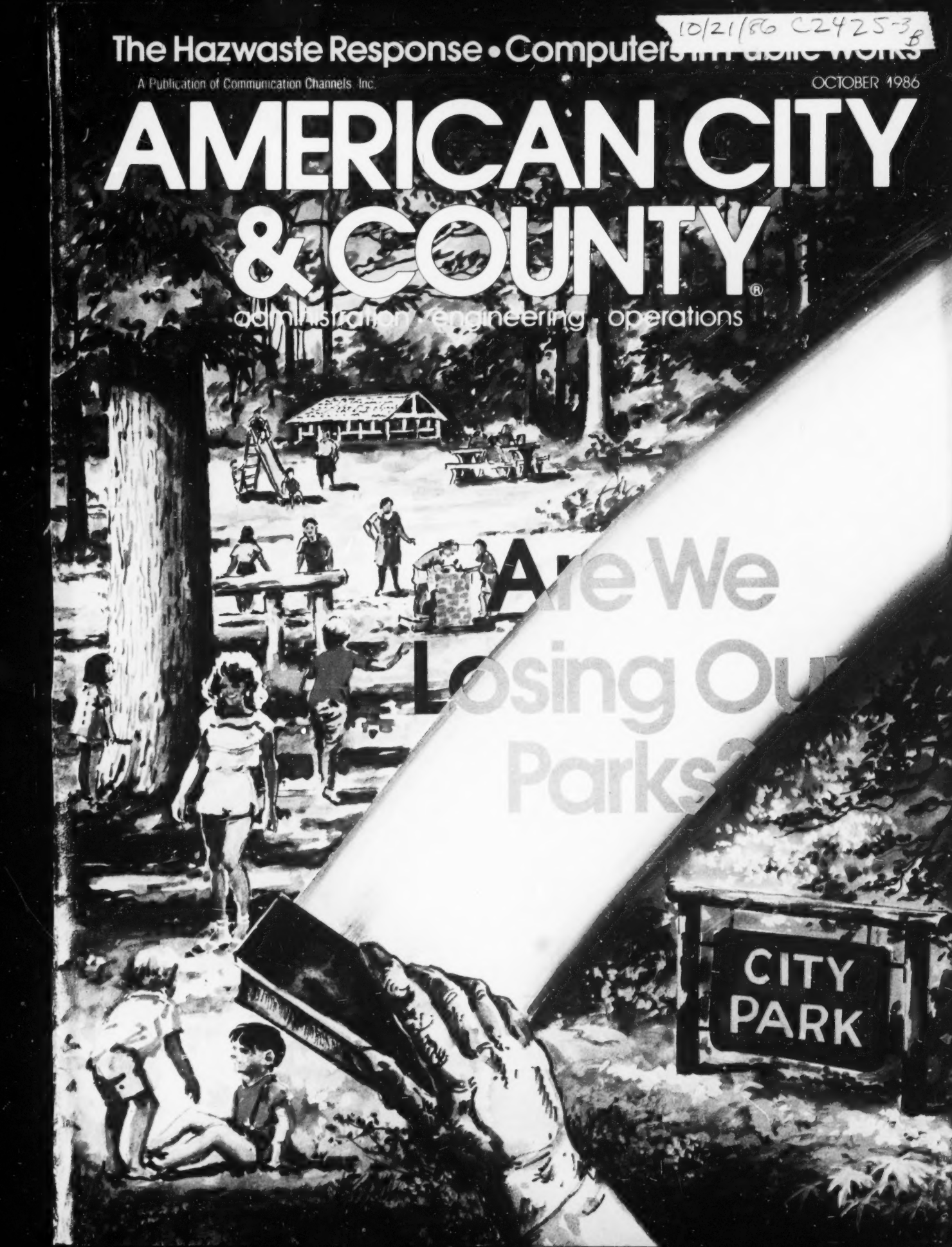

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October 1986 Vol. 101, No. 10

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About the Cover

The combination of expanding urbanization and dwindling funds paints a bleak future for the nation's parks and recreation facilities. This month's cover is an original illustration by Harry Rossoll, renowned artist and the creator of "Smokey Bear." Rossoll, who served for 35 years as an artist for the U.S. Forest Service, lives in Atlanta. In addition to Smokey, he has created several other woodland characters to illustrate the need to conserve the nation's woodlands.

Hazwaste Response **58**

In which areas do you use computers?*

Utility Billing/Maintenance	37.3%
Police/Fire Services	21.4%
Parks & Recreation	10.8%
Solid Waste Collection/Disposal	7.7%
Traffic Engineering/Control	5.9%
Building Maintenance/Security	2.7%
Public Transit	2.7%
Other	6.2%

* Taken from an exclusive American City & County survey, July 1986

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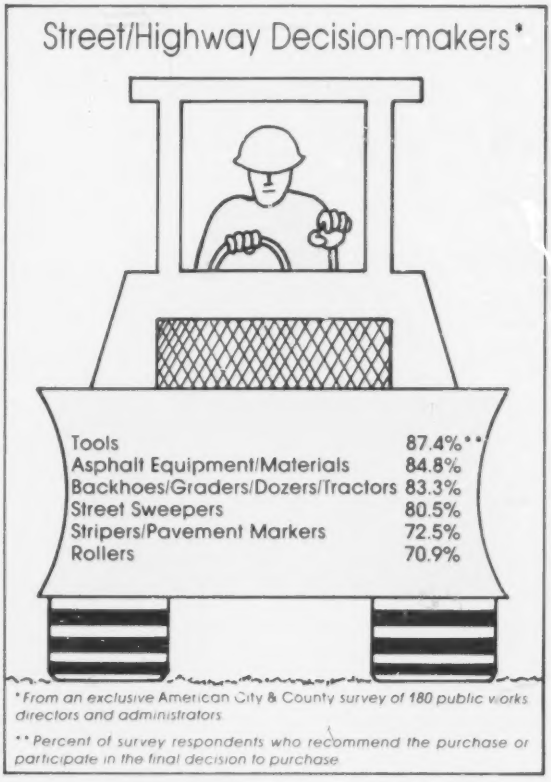
Equipment Purchasing Habits Surveyed

More than half of the nation's municipalities will be purchasing new automobiles or trucks within the next year, according to an exclusive *American City and County* survey of public works administrators and municipal officials. Of the 180 survey respondents, 75 percent represented municipalities with populations of 50,000 to 150,000.

Respondents revealed their roles in the decision-making process for heavy equipment purchases **(see chart)**. Nearly three-quarters either participated in the final decision or recommended products for auto, truck, backhoe, grader, dozer, street sweeper and tool purchases.

Respondents also were active in the decision-making process for engines, loaders and refuse vehicles, pipe, rollers, salt and sand spreaders, snowplows and stripers, with more than 50 percent either directly involved with or consulted on the final purchasing decision.

In addition to trucks and automobiles, the survey found nearly 40 percent of the communities planned to buy asphalt equipment/materials and tools within the coming year. Approximately one-third of the respondents said their community would be purchasing backhoes, graders, dozers or tractors, and pipe for both sewer and water lines. Snowplows, street sweepers, salt and sand spreaders, and loaders and refuse vehicles will be purchased by more than 20 percent of the communities involved in the survey.



*From an exclusive American City & County survey of 180 public works directors and administrators

**Percent of survey respondents who recommend the purchase or participate in the final decision to purchase

GRCDA Conference Conducted in Reno

Hazardous wastes and resource recovery drew the most attention at seminars and exhibits during the recent annual meeting of the Governmental Refuse Collection and Disposal Association (GRCDA) held in Reno, Nev. Nearly 1,000 GRCDA members attended the three-day conference, which featured more than 130 exhibitors of waste collection and disposal products and services.

Seminar sessions followed five tracks — collection, disposal, landfill gas, hazardous wastes and resource recovery — with the heaviest attendance in the hazardous wastes and resource recovery discussions. Of particular interest in the hazardous waste area was local government responsibility for the collection and disposal of such wastes from small-quantity generators (SQG).

Barry Shanoff, counsel for GRCDA, noted that the U.S. Environmental Protection Agency is not giving SQG a priority in its regulation consideration. EPA, he said, expects control of SQG to cost local governments only $100 million, a figure Shanoff cited as much too low. If there is to be any EPA enforcement, he added, it will come from the agency's regional offices.

Local government officials are going to encounter increased pressure regarding SQC collection and disposal, Shanoff warned, particularly to provide instructional materials for small-quantity generators.

Jim Sweeney of Anchorage, Alaska, said that local officials will have to solve their own SQC problems and should not expect much help from the state and federal levels. His municipality, he said, already has established a hazardous waste program, including a Mayor's Hazardous Waste Task Force. Anchorage also has conducted its own hazardous waste study, including an inventory of generators and amounts of waste, disposal methods and technology, and other disposal options available.

NORTHEAST

Tewksbury To Open Water Treatment Plant

The town of Tewksbury, Pa., has relied on groundwater obtained from several wells as its main source of drinking water, but recent quality problems in the well supplies forced a change. The town has started construction of a new 3.5-million-gallons-per-day water treatment plant, utilizing the Merrimack River as the supply source.

The new facility will include a river intake system and a raw water pumping station to bring river water to the plant. The conventional treatment process of chemical addition and mixing, flocculation, sedimentation and filtration will be employed. A finished water pumping station and pipeline will convey the treated water to the town's distribution system for delivery to consumers.

Total cost of the project, designed by Boston-based Camp Dresser & McKee, will be approximately $8.3 million. The town received a grant of nearly $4 million from the state under the Chapter 406 Construction Grants Program, administered by the Department of Environmental Quality Engineering. Completion is scheduled for February 1988.

Wayne, N.J.: Construction has begun on a redevelopment program in the town's Mountain View section. A cooperative effort between the township and Chamber of Commerce began with a plan for increased parking for shoppers, better traffic circulation, new railroad station and commuter parking, and general streetscaping with new lighting, trees and brick sidewalks. The RBA Group, an engineering firm, also incorporated drainage and flood control improvements, and removal of blighted areas. The project is being funded in part through grants from New Jersey Transit and the Small Cities Grant Program.

Rockland, Mass.: A check for nearly $20,000, representing a 75 percent share of the savings Metcalf & Eddy achieved during its third year of operating the community's wastewater treatment sys-

Using Computers In Public Works

Office automation in city governments is spreading from typical financial applications to other departments, including public works, resulting in sudden changes for established practices.

By Joe Morris, Assistant Editor

The image often perceived of the typical public works department is changing rapidly with the advent of office automation systems. Modern computing techniques are being implemented by municipalities nationwide in all departments, including public works. While many departments are finding computers helpful in maintaining records and inventories, others are using innovative software for everything from street maintenance records to state-of-the-art drafting.

Within the past few years, computerization has spread from the finance offices to all aspects of municipal operations. A broader market for hardware and software has increased computer usage and computer literacy by local government employees. And although start-up difficulties occur, most say computerization is a boon. Now the computer trend is changing the face of public works departments as well.

In a recent *American City & County* survey of municipal officials, computer usage was found to be on the rise. The survey also showed increased computer usage in public works departments for a variety of applications. According to the survey, 37 percent use computers for utility billing and maintenance, a predominantly public works function. And more than 7 percent now are using computers to keep track of solid waste collection and disposal.

The survey also showed computers are used by 10 percent for parks and recreation, 6 percent for traffic engineering and 3 percent for public transit. With continued innovations in computer equipment, these numbers are likely to rise.

Palm Beach, Florida, automated its police and financial departments first, like most municipalities. But then the Public Works Department was brought into the computer age, forcing some changes, says Albert Dusey, public works director.

"We got into computers about two years ago," Dusey says, "and we're still adapting to them. Everyone learns at a different pace, but my assistant director has gotten quite good with the machines, and is leading the way in training the department."

Dusey, like most public works directors, asserts that the time saved from using computers is compensating for drops in productivity and efficiency occuring when computer systems first are installed.

"The computers are increasing our ability to manage resources," he says, "and that increases productivity."

Phil Bloom, city engineer for Moses Lake, Washington, agrees, adding "all areas of the public works department are using the computers, and it sure makes things faster." Moses Lake's IBM and Hewlett-Packard systems have been in operation for just over two years,

In which areas do you use computers?*

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Police/Fire Services	21.4%
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Solid Waste Collection/Disposal	7.7%
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Building Maintenance/Security	2.7%
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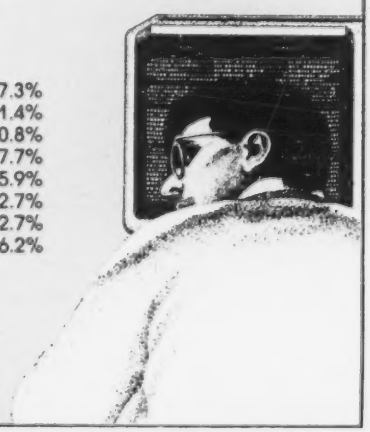


*Taken from an exclusive American City & County survey, July 1986.

Bloom say of the city's setup.

While smaller municipalities are just getting into personal computer applications for public works, larger cities are on the cutting edge of computer technology. In Indianapolis, Public Works Director Barbara Gole says her department has automated some operations completely.

"Our wastewater treatment plants are completely computerized," Gole says, "and systems for wastewater treatment and inventory control for sewer maintenance are being done now."

Indianapolis also is developing computerized routes for its solid waste division, another innovative process. The city's Northrop and IBM systems have been in use since the early 1980s.

In addition, the city's departments are joining with public utilities in a computerized mapping program. "Pretty soon, anything in the city will be able to be graphically located using this system," Gole says.

Cheyenne, Wyoming, also is utilizing computerized mapping and drafting systems, as well as a variety of other computer techniques, says Gary Grunkemeyer, public works director.

The Cheyenne Public Works Department system, which features IBM, Hewlett-Packard and LAN card systems, is being expanded in phases, Grunkemeyer says, with a CADD (computer-aided design and drafting) system planned for future use. The Cheyenne system is unusual in that the department began automating four years ago, ahead of all other city departments except accounting. The early start for public works automation allowed the department to get ahead of other communities in the region, Grunkemeyer added.

"We're getting a lot of calls from other cities in the country, because they're finding out what we're doing from our vendors," he says.

The automation trend is picking up speed across the country, but various difficulties now are presenting themselves, impeding progress for local governments. One problem faced by public works departments planning to automate their operations is a lack of funds. With federal and local budget cuts looming on the horizon, department directors often must curtail plans for expansion.

"With public works budgets being what they are, my plans may change," says Hal Leedom, public works director for Dodge City, Kansas. Leedom's department began automating with IBM personal computers in late August.

"Right now, we're planning to do everything we can on them, including drafting. If the money holds up, I plan to bring a CADD plotter in by 1989," Leedom says.

"We've been very lucky," Gole says. "We saved almost $200,000 in our liquid waste department last year, partly

At first, expect drops in productivity, equipment trouble and staff reluctance.

Lakewood Computers Update Diverse City Functions

"The ability of management to grasp what could be accomplished led to the computerization of all departments," says Anthony Mineo, Lakewood, Colorado's data processing manager. The city recognized the importance of computers for all city functions, not just the "traditional accounting and payroll," Mineo adds.

The city's computerization efforts began in 1978. Lakewood had been using two service bureaus for data processing functions, but the growing expense forced the city to establish its own computer resources.

Mineo explains the phenomenal growth in Lakewood's data processing requirements. "We promoted our data processing capabilities to the city. We looked at what people were doing and how data processing could make their lives easier. The more departments we converted, the more that wanted data processing.

"The growth of PCs also increased computer literacy among city staff members and showed the potential for data processing," he adds.

Lakewood's first computer system was installed in 1979. The McDonnell Douglas system had 16 terminals and 300 MB of disk storage. Mineo and two programmers converted all the city's old programs to run on the new system, and wrote several new applications. By 1981, the Reality 6000 system was running on-line payroll, budget, financial management, utility billing, police activity and police traffic enforcement systems. By 1982, Lakewood had outgrown its original system, and a second was added to accommodate growing police requirements.

In August 1983, both systems were traded for a larger system, the M9000. The conversion from the old system to the new was simple, says Mineo. "We just did a file save on the old systems, converted the tapes from 800 bpi to 1,600 bpi, loaded the accounts on the M9000 and compiled the programs. The new machine was up and running overnight," he says.

Today, Lakewood utilizes 80 ports on its system, and plans to add 16 ports in the next few months. With the use of port contention devices, the 96 open ports will support 120 terminals easily, Mineo says.

A system for the municipal court, completed in 1984, automates all functions involved in court administration, including probation counseling and police record-keeping. The system, rated best in the state according to Mineo, also allows record updating and fee payment.

Another program allows police property to be identified using a bar-code system. Lightwands are connected to the computer, automating the logging in and out of evidence and property.

Another police-oriented program, computer-aided dispatch (CAD), allows rapid response to citizens while improving officer and firefighter safety. The dispatcher types all relevent information from a call, and the screen displays the recommended units to be sent to the incident. The recommendation is based on the address of the incident, and a pre-defined table for the incident type.

Other programs utilized by the city include land-use and building permit systems, allowing the city to track all permits issued within city limits, and creating a database to provide zoning information for new developments.

"The population has grown from 85,000 in 1979 to 135,000 today," Mineo says. "While city functions have had to grow to accommodate the increase in population, most have been handled by the computer. In the accounting sector, no new employees have been added. We've gone from three basic applications in 1979 to approximately 18 major computer programs today." □

due to improved productivity, partly due to computers. That justifies using more computer systems."

"This year, we had $60,000 budgeted for computers, which is the same as last year," Grunkemeyer says. "We've got a couple of people on City Council who are attuned to computers, and they fight for us when we need help."

The wide use of computers within public works also helps to make them a viable expenditure, keeping automation equipment safe from budget-slashing procedures.

"Our secretaries use them for word processing, and we keep our maintenance systems and work records on the computers," Palm Beach's Dusey says. "Right now, they're divided up about 50-50 between the office and field staffs."

In most areas of the country, larger cities led the way in office automation. Many smaller cities, particularly in the Southeast and Southwest, are experimenting with office automation for the first time. And these trial efforts may or may not lead to full automation for those departments.

The wide use of computers in public works keeps them safe from automatic budget slashing.

"We've had an IBM personal computer for just over a year," says Dick Renshaw, acting city engineer for Boulder City, Nevada. "All of the city's departments are partially automated, and we are in the process of changing in the public works department. We want to become automated, and hope it will increase our efficiency."

Fort Thomas, Kentucky's Public Works Department has not begun the automatization process yet, according to director Hershel Roell, but may be doing so within the next few years.

"The city has had systems for about four years in the main city building," Roell says, "but we don't have anything in public works yet."

The department keeps some of its street maintenance records in the main city computer, and Roell says the efficiency of that system has convinced him of the viability of computers in the public works arena.

"I would definitely like to see the department automated," he says, "because automation is usually better."

Despite glowing reports of increased efficiency and accuracy in record-keeping, all is not simple when converting a public works department from manual to computerized filing and document recording. At first, expect drops in productivity, minor equipment trouble, and reluctance on the part of some staff members to adapt to the new system. The initial glitches do not have a long duration, however, and soon the system

Aiken County Solves Space Problems

By Julian L. Mims

What if local government could save a million dollars on storage costs? The problem of limited office space is a universal one for cities and counties, but practical solutions are available.

Aiken County, South Carolina, was out of office space. A new judicial center was needed urgently, but the price was too high. The county gained sufficient office space for its expanding operations without wrecking the budget with a combination of records management and microfilming.

The major reason for the courthouse space-crunch was the pervasive and relentless accumulation of records. Therefore, Aiken County officials sought an immediate and continual means of clearing unnecessary hard copy from county offices. Within each department, any record not being used once a month would be deemed "inactive" and consequently earmarked for off-site storage. At the inactive records storage facility, high-rise shelving would permit a storage ratio of 5 cubic feet of records to each square foot of floor space.

Surplus records now routinely channeled to the storage center should free space in work areas across the entire county. The county expects resultant savings in file equipment and supplies, floor space and staff retrieval time will be 80 percent above the expense of maintaining the same data in prime office space.

Especially significant will be the quick effects of this solution. No more than a year after project inception, as much as two-thirds of the total records in each office may be removed to inactive storage. Secure and accessible data control will be achieved at extraordinary savings.

Inactive records control is complemented with an innovative application of microfilm technology. County officials realized 2,500 documents could be reduced to a single roll of microfilm, and one workstation could house the data of an entire office. Microfilm offered advantages over and above space savings, especially for certain types of records. The micrographics system, for example, could give special attention to those records that must be protected in perpetuity, such as wills and judgments or that must be retrieved quickly, such as law enforcement and real property information.

For this high-profile data, microfilm would offer fast and convenient copying, safeguards against misfiling, and off-site security deposits. Most importantly, microfilm would provide ready retrieval. Aiken's data system allows instant-retrieval-to-key document, meaning immediate access not only to a file, but also to a key document within a file. By establishing instant-availability of its information, Aiken is one of the first counties in the nation to employ this technology.

Records accumulation is a major culprit in exhausting available office space. To control inactive records, Aiken County is developing records-retention guidelines and a storage center, which may remove 75 percent of all records from county offices. Under this plan, data can be housed at one-fifth of the previous maintenance cost.

In addition, the county is entering high-profile data into a microfilm system, wherein any one of 2 million pages of files is retrievable within seconds. The combination of microfilming and inactive records control is easing most of the current space problem, and will continue to prevent future re-accumulation of hard copy.

The bottom line of the project is cost savings. Space savings reduced the price of Aiken's judicial center by 20 percent up front, as an entire story could be eliminated from the original building plans. The office building could be built within budget, as the space-saving plans reduced costs by $1 million. □

Julian L. Mims is the coordinator of central services for Aiken County, S.C.

is up and running with few or no problems.

The initial training can be aided greatly by having one person on staff who is well-versed in computer operations. While most companies provide training on new equipment, an in-house expert can ease many fears held by staff members.

"We started with a core of people who were well-versed on computers, and they have trained other people," Gole says. "Basically, it's a ripple effect. Those who have been using the computers the longest are the most familiar, and they help those who are new to the systems.

"Most of the computers have caught on," she adds. "Now the staff can't get enough of it — everyone wants a computer. We've brought 40 to 50 in within the last four years."

For those public works departments in the midst of automation, adapting to a new system often is complicated by the advent of new software and hardware. In Bangor, Maine, the city is going through piecemeal computerization, including the Public Works Department, says James Ring, public works director.

> ***"We're planning to do everything on them, including drafting."***

"We're partially done with automating our department," Ring says. "We're doing transfer vouchers, job-cost analyses, things like that on the computer. We're still doing some things by hand, but we're moving toward total computerization."

The department began automating two years ago, using a Sperry system similar to the one utilized by the city offices. Within the next few years, the department will be computing its pavement management function, as well as wastewater treatment and road maintenance, Ring asserts.

"The computers are obviously a great time saver," he says. "There's much less handwork, and we can get job cost totals the next day instead of several days later. With our somewhat limited experience, I would say the computers are great. We're late getting into them, but they're saving lots of time."

Dodge City, Kansas, is just beginning to automate its public works department, and director Hal Leedom expects the early days to be less than auspicious.

"You have to learn to use something to make it be productive," he says. "But we're doing a lot by hand now, and we intend to get out of that as quickly as possible."

Municipalities, particularly those currently installing or updating software, are generating programs to suit their own needs. While many vendors offer specific software to run public works-oriented programs, many cities prefer to generate their own.

"We have, in some cases, forced software contractors to re-do things," Grunkemeyer says, "because what they had on the shelves was not sophisti-

Cumberland Saves With Outside Service

In these times of shrinking federal and state aid, county and municipal governments and agencies sometimes save money using a data processing service rather than establishing an in-house department. For some large entities, having the in-house mainframe may be convenient, but counties with small populations could find such a situation both impractical and costly.

The experience of Cumberland County, Pennsylvania, is a case in point. The county is the state's fastest growing, with most of its 189,000 residents living near Harrisburg, the state capital. The county government, based in Carlisle, has been updating its data processing services since 1979.

Starting with the controller's office, the county switched from batch processing to computer terminals on-line with a Burroughs B-1900 series mainframe located 20 miles away at EUR Datacenter in Mechanicsburg. Other departments soon followed, increasing efficiency and lowering costs.

Cumberland County's annual service with EUR is $1.03 per capita, compared with $2.86 for an adjacent county with an in-house data processing department.

"Other counties have hired skilled staff that require high salaries in order to run their in-house computers," says Marcia Myers, who chairs the Cumberland County Commission. "We never had to have a data processing department."

An in-house installation would force the county to put all departments on-line at one time and require hasty staffing, adds Majority Commissioner Robert Adams. The installation, programming, personnel orientation and training would be a lengthy process that might disrupt county administration, he says.

Computer technology changes constantly as new technology emerges. A purchased system could lock the county into hardware that could be obsolete in a short period of time, says Minority Commissioner Robert Moore. A data processing service not only provides updated technology but the staff to operate the equipment, he says.

For other counties considering data processing, the Cumberland County commissioners recommend a thorough economic study comparing the pros and cons of establishing an in-house department and retaining a service.

The possibility of telephone service interruption due to storms or other interference need not be a problem, as terminal operators can record data on forms until service is restored. Special safeguards also are available that prevent data being handled for another county to be accidentally fed into Carlisle.

Since implementing the system, purchase orders can be verified against budgets automatically. When the vendor submits an invoice for payment, it also goes through the system for verification against the budget. This allows payment to proceed quickly, and the county often is able to take advantage of prompt payment discounts. Each week, 400 to 500 checks are prepared by an on-line printer connected to the county's system.

Payroll for the county's employees also is processed quickly. The mainframe in Mechanicsburg identifies each employee, computing the salary and the applicable deductions. The computer effects direct deposit action into the local credit union, and automatically tracks authorized vacation, sick leave, and paid holiday time. The output is accepted by the Pennsylvania Department of Labor and Industry.

Starting in 1981, the county began processing election returns with the system, making information available to the local media much faster. In addition, the county currently is planning to put the Prothonotary and the Clerk of Courts offices on-line, for access to legal opinions and criminal records. □

cated enough. I think we'll see a lot more of that in the future."

"We expect to be doing a lot of modifications to our systems to use as many different types of software as possible," Leedom says.

"We're still learning to use our computers — they're toys at the moment," Renshaw adds. "But we've started pavement programs and street inventories and we should be increasing our speed and efficiency over past records."

As computer literacy grows in public works departments, and as computer equipment becomes more advanced, smaller communities will be moving into programs currently operated only by their larger counterparts. For example, Indianapolis' wastewater management programs, while new, will soon be copied and adapted to the needs of smaller communities. And other programs will soon follow suit, says Bangor's Ring.

"We're a few years away from pavement management and wastewater control, but we're keeping files on road maintenance, and adapting as quickly as possible," he says.

"Our next phase will be to put the building inspection and engineering department records on computers. That should be a great time saver," adds Cheyenne's Grunkemeyer.

Computer usage in local government seems certain to grow and expand, in light of updated technology and the industry's vigorous pursuit of local government dollars. Equally obvious are the pitfalls facing governments, particularly a lack of available funds on both the local and federal levels.

Public works departments, whose budgets are often under attack, will find it increasingly difficult to make computer purchases. With that in mind, several directors are combining systems with other departments, or other organizations within the city. Fort Thomas' use of the city's equipment for record-keeping purposes, and Indianapolis's computer mapping system, shared with the local utilities, are two examples of such cost-saving measures.

In addition, as the time-saving and efficiency improvement aspects of computerization catch on, public works departments will move into automation as a cost-saving measure. As budgets are trimmed by General Revenue Sharing decreases and Gramm-Rudman-Hollings, public works directors will be seeking new ways to stretch local dollars to the limit. And computers, although costly in the beginning, may be the method of choice to save money in the future. □

Hennepin County Centralizes Office Copier System

In a sweeping modernization program, the Central Services Division of Hennepin County, Minnesota, replaced six different makes of older office copiers with one standardized line, and linked them together in a central copier system for automatic data gathering and analysis.

As an additional benefit, the county reduced copying costs from 6 cents per copy to 4¼ cents. Richard Schultz, director of accounting and purchasing for Hennepin County, says two main goals were "to improve employee productivity and to reduce the direct costs of copying a document."

To implement the county's goals, Donald Garrison, Central Services Division manager, devoted six months to an intensive investigation and testing process. Starting in summer 1983, pre-bid conferences were held with major copier manufacturers to discuss specification options. These discussions resulted in key decisions regarding copier requirements.

Three usage ranges were identified: low (up to 7,000 copies per month), medium (up to 25,000 copies per month), and high (more than 25,000 copies per month). Appropriate equipment for each range would be purchased.

Edge-to-edge copying was essential for general convenience, but also for true and exact copies of court records and other official documents, such as welfare client files, birth and death certificates, automobile and boat ownership registrations, and property deeds and tax files. For the copies to be certifiable as true and exact, all the data on the document must be reproduced. A maximum allowable blank margin of 3 millimeters was established to meet this legal requirement.

Some of the machines needed advanced features, such as two-sided copying, reduction and enlargement, and the ability to produce overhead transparencies and address labels. Price and productivity were bottom-line factors.

Six companies were invited to submit machines for testing in county offices. After a 45-day testing period, each employee completed a questionnaire, grading the quality, speed, downtime, ease of operation and user friendliness of each test machine. As a result of the testing, a contract was awarded for small- and medium-volume Toshiba machines. High-volume copiers were not purchased since only six or seven locations needed high-volume machines, and the cost of those units was disproportionately high.

Today, with 190 copiers in operation throughout Hennepin County, the copier control system is in full operation. Each copier is linked by telephone communication cable to the Central Services Division and usage is recorded on nine-band magnetic tape automatically. Each month, the taped records are processed by the county's mainframe computer to generate billing back to the using department. In addition, reports including run length, copies per terminal and copies per user are generated.

Schultz says the county plans to utilize the methodology and procedures used for copiers on other office equipment in the future "to standardize purchases and to reduce costs. We are moving into networking with PCs in the next few years to communicate inter-office memoranda, reports and documents. That may cut down on some of the growth of convenience copying that we now experience." □

Government Agencies Topic of APCA Guide

The Air Pollution Control Association (APCA) has published its 1986 directory providing information on air pollution control and hazardous waste management agencies at all government levels in the United States and Canada. Information includes names, titles, addresses and telephone numbers of the heads of each agency housing the respective control programs, heads of intermediate departments, and operating heads of control programs. Also contained are supplementary personnel and laboratory data.

The price of the directory is $4 for APCA members and $8 for nonmembers. To obtain a copy, write to Publications Department, Air Pollution Control Association, P.O. Box 2861, Pittsburgh, Pa. 15230. □

NEWS

Yearbook Outlines Industry Expansion

The 1986-87 Resource Recovery Yearbook indicates several significant trends occurring in the waste-to-energy industry, including changes in the type of technology used, the size of plants, ownership tendencies and growth patterns. Published by Governmental Advisory Associates, the third edition of this bi-annual publication analyzes 269 projects in the United States, including 16 methane recovery facilities and 194 projects in advanced stages of planning, under construction, operational or shut down. Only 123 projects were reviewed in the yearbook's first issue in 1982.

"Clearly, the number of facilities in the United States is expanding, and all indications are that the resource recovery industry will continue to experience significant growth in the coming years," says yearbook editor Robert Gould.

The study identifies 75 resource recovery facilities in conceptual stages of planning. Of these, 41 percent will be built in the Northeast, 23 percent in the South, 19 percent in the North Central region and 17 percent in the West. The percentage of planned facilities has jumped by 10 percent in the Northeast, compared with figures in the 1984 Yearbook, while the total for the West has dropped by 8 percent.

New projects are scheduled in 30 states, with 54 percent expected to be on-line by 1990. The study further shows that 40 percent of the planned facilities will use mass burning-waterwall incineration, 27 percent will use modular mass burn, 17 percent will install other mass burn technologies, and 10 percent will produce refuse-derived fuel. Private sector firms will own 42 percent of the planned facilities, and operate 74 percent.

The study shows that $2 billion will be spent to construct these facilities during the next six years, with as much as 18 million tons of refuse being processed.

For advanced-planned and existing projects, 37 percent are located in the Northeast, 33 percent in the South, 16 percent in the West and 15 percent in North Central. While the South has the highest number of existing facilities at 43 percent, compared to the Northeast's 30 percent, the number of advanced-planned and existing facilities is increasing in the Northeast and West, compared to 1984 figures.

Nationwide, resource recovery projects in all stages of development are located in 44 states, with mass burning the prevalent technology. Showing a trend away from steam generation and toward electricity production, the study estimates the average facility will produce 25,537 kilowatts of electricity, and the total power produced nationally will rise from 538 megawatts today to 2,732 megawatts in 1992. The yearbook predicts 35 million tons of refuse per day will be processed by the 269 facilities reviewed, or approximately 26 percent of the municipal solid waste generated in the United States.

Other trends in the industry outlined in the yearbook include:

- the sample of facilities has expanded over 50 percent since 1984, indicating continued growth in the industry;
- materials recovery will become increasingly prevalent in future installations;
- air pollution control equipment has become more sophisticated across all technologies and sizes of facilities;
- unforeseen plant outages continue to occur and should be taken into account with respect to contingency planning; and
- private sector involvement, in terms of plant ownership and operation, has steadily increased.

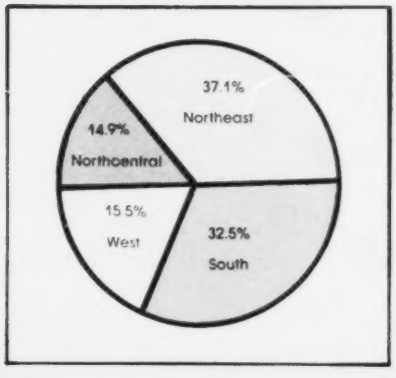
For further information from the yearbook, contact Robert Gould or Eileen Berenyi at Governmental Advisory Associates Inc., 177 East 87th St., New York, N.Y. 10128, (212) 410-4165.

Facility Status By Type of Process
(From the 1986-87 Resource Recovery Yearbook)

Status	Type of Process: Mass Burning (except modular)	Mass Burning, Modular	RDF (all technologies)	All Facilities
Advanced Planning	53.2%*	20.6%	37.0%	37.1% (72)
Construction	17.7	11.1	8.7	12.9 (25)
Shakedown, Operational	24.1	58.7	30.4	36.1 (70)
Shutdown (temporarily or permanently)	5.1	9.5	23.9	13.9 (27)
Total Percent (Total Number)	100.0 (79)	100.0 (63)	100.0 (46)	100.0 (194)

*Percentage of column.

Location of Plants By Region: All Facilities



BRIEFS

China: A delegation of 46 U.S., Canadian and English solid waste management professionals traveled to the People's Republic of China recently as part of a program developed by Gershman, Brickner and Bratton Inc. of Washington, D.C., and sponsored by People-to-People International of Spokane, Wash., and the Chinese Environmental Protection Society. The delegation met with waste management officials in Beijing, Shanghai, Wuhan and Canton, where they made presentations on landfills, recovery methods, collection equipment and overall system operations. □

MUNICIPAL COST INDEXES

The **Municipal Cost Index** for October dropped almost half a point from September, falling to 339.4. The **Construction Cost Index** also posted a small drop, its first in several months. While the **Consumer Price Index** made a slight gain from September's figure, the **Producer Price Index** continued its slump.

In this month's marketbasket, prices in the fuel oil family continued to slide, with diesel fuel and fuel oil no. 2 each dropping almost 18 percent from last month's figures. In the last year, the fuel oils have dropped more than 50 percent cumulatively.

Other products showing losses in October were gypsum products, plumbing fixtures and lubricants.

— Compiled by Joe Morris

THIS MONTH'S MARKETBASKET

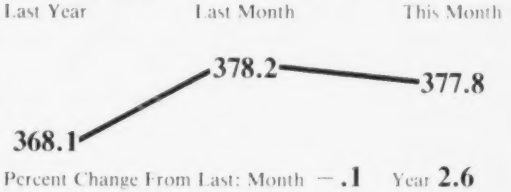
	Current Index	Percent Change From: Last Month	Last Year
Air Conditioners	149.3	.1	1.3
Apparel	185.0	-.2	1.1
Asphalt Roofing	387.0	-.2	-5.7
Books	139.5	.6	5.4
Chemicals, Industrial	317.5	.4	-6.6
Coal	538.5	0	-2.1
Concrete Products	325.9	.2	1.4
Construction Machinery	366.9	0	1.3
Diesel Fuel	286.9	-17.7	-52.7
Electric Components	202.5	.7	2.5
Electric Lamps	347.5	.1	1.0
Electric Power	467.3	.6	1.1
Engines, I.C.	354.2	.3	2.0
Fans, Blowers	365.6	-.6	1.6
Fertilizers, Mixed	254.5	-.3	-1.5
Floor Coverings	194.0	-.5	1.8
Flow Instruments	236.9	.7	2.2
Footwear	261.4	.3	1.7
Foundry Products	363.5	-.3	0
Fuel Oil No. 2	308.9	-18.6	-49.3
Furniture	319.3	1.1	3.0
Gasoline	317.1	-19.2	-46.1
Generator Sets	353.8	1.2	.5
Glass	233.9	1.9	3.4
Glass Containers	399.5	0	3.3
Gypsum Products	347.7	-1.7	2.7
Hardware	306.5	0	-.2
Heating Equipment	268.6	-.4	3.3
HVAC Controls	128.0	.7	.4
LP Gas	353.5	-6.3	-31.5
Lubricants	369.4	-1.0	2.5
Lumber	316.5	1.6	3.5
Metal Fabrications	316.0	.1	.4
Millwork	321.6	.3	2.6
Motor Vehicle Parts	358.4	0	1.0
Mowers	263.9	0	.8
Natural Gas	1194.1	-.5	-14.6
Office Machines	154.2	-.1	-.3
Paint	282.4	.4	2.0
Paper	305.6	.4	.6
Passenger Cars	233.9	.4	2.2
Plumbing Fixtures	323.8	-.1	3.5
Plywood	236.2	.4	-.2
Portland Cement	350.5	-.8	-2.8
Residual Fuel	434.7	-13.0	-52.1
Sand, Gravel	318.9	.3	2.9
Sanitary Papers	383.1	-.1	1.7
Soaps, Detergents	274.0	0	.2
Sporting Goods	206.4	.8	1.4
Steel Mill Products	349.2	0	-4.6
Struc. Clay Products	308.7	-.2	4.0
Switchgear	285.3	-.5	1.2
Tires, Tubes	233.5	-.8	-1.8
Transformers	232.1	-.2	0
Trucks	347.4	1.3	4.2
Valves	106.9	.3	1.8
Wire, Cable	205.6	-.4	.6
Wiring Devices	375.6	.6	3.8

At-A-Glance Changes

MUNICIPAL COST INDEX

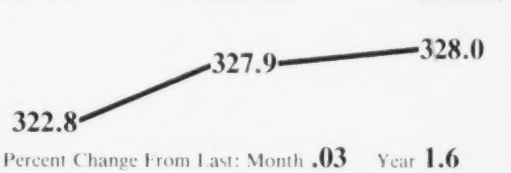
Percent Change From Last: Month -.1 Year .7

CONSTRUCTION COST INDEX



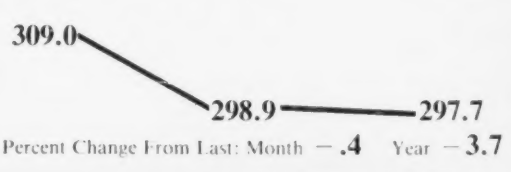
Percent Change From Last: Month -.1 Year 2.6

CONSUMER PRICE INDEX (BLS)



Percent Change From Last: Month .03 Year 1.6

PRODUCER PRICE INDEX (BLS)



Percent Change From Last: Month -.4 Year -3.7

QUARTERLY MUNICIPAL TRENDS

	Current Level	Percent Change From: Last Qtr.	Last Year
Receipts	608.4B	2.6	8.4
Federal Grants	106.1B	2.5	7.9
Durable Purchases	22.4B	2.3	9.3
Consumables	36.8B	-4.9	-4.2
Services	371.9B	1.8	7.8
Structures	61.4B	11.6	13.3
Salaries, Wages	297.7B	1.9	7.2
Surplus	70.0B	12.0	6.7
Employment	13.784M	-.2	2.2